36127/P
85725

A

DISCOURSE

Concerning the

ACTION

OF THE

SUN and MOON

ON

Animal Bodies;

AND

The INFLUENCE which this may have in many Diſeaſes.

By *RICHARD MEAD*, M.D. F.R.S.

In Two PARTS.

LONDON:
Printed in the Year 1708.

A

DISCOURSE

Concerning the

ACTION of the SUN and MOON on *Animal Bodies.*

PART I.

THAT ſome Diſeaſes are properly the Effects of the Influence of the heavenly Bodies, and that others do vary their Periods and Symptoms according to the different Poſitions of one or other of thoſe luminous Globes, is a very antient and certain Obſervation. Upon this Score *Hippocrates (a)* adviſes his Son *Theſſalus* to the Study of Geometry and Numbers, becauſe *the Knowledge of the Stars is of very great Uſe in Phyſick (b).* And the earlieſt Hiſtories of Epidemick Diſtempers, particularly do all turn upon the Alterations made in our Bodies by the Heavens.

But when in later Times Medicine came to be accommodated to the Reaſonings of Philoſophers;

(a) *Epiſt. ad Theſſalum Filium.*

(b) Οὐκ ἐλαχίστου μέρους συμβάλλεσθαι Ἀστρονομίην εἰς Ἰητρικήν. De Aere Aquis & Locis.

no body being able to account for the Manner of this celeſtial Action, it was allowed no farther Share in affecting our Health, than what might be imputed to the Changes in the manifeſt Conſtitution of the Air, excepting perhaps ſomething of Truth which ſtill remains diſguiſed and blended with the Jargon of judiciary Aſtrology.

In order therefore to ſet this Matter in a little clearer Light, I ſhall in the firſt Place ſhew, That the Sun and Moon regarding their Nearneſs and Direction to the Earth only, beſides the Effects of Heat, Moiſture, *&c.* thereby cauſed in our Atmoſphere, muſt at certain Times make ſome Alterations in all Animal Bodies; then enumerate ſome Hiſtories and Obſervations of ſuch Changes, and enquire of what Uſe ſuch Thoughts as theſe may be in the Practice of Phyſick.

It is a conſtant Obſervation of thoſe who write the Hiſtory of the *Winds*, That the moſt windy Seaſons of the Year, are the Time about the Vernal and Autumnal Equinox; for be the Air never ſo calm before or after, we never fail of having Winds at that Juncture. Every body likewiſe knows, that in the moſt quiet Weather we are ſure of ſome Breeze at Mid-day and Midnight, as alſo at full Sea, *i. e.* always about the Time the Sun or Moon arrive at the Meridian. Seamen and Country People reckon upon this, and order their Affairs accordingly. And the Changes of the Weather as to Winds or Calms eſpecially about the new and full Moon, are too well known to require any Authority to confirm ſuch Remarks. Thoſe who deſire a fuller Account of theſe Obſervations, may ſee it in *De Chales*'s Navigation, *Gaſſendus*'s Natural Philoſophy, and *J. Goad*, his *Aſtro-Meteoro-Logica*.

Theſe

Theſe Things being Matters of Fact, and in a Manner regular and univerſal, it may very well ſeem ſtrange that Philoſophers have not been more accurate in their Enquiries into the Reaſon of ſuch Appearances. True indeed it is, that the Origin of Winds is various and uncertain, but however, ſo conſtant and uniform an Effect muſt undoubtedly be owing to one neceſſary Cauſe.

It has been, now a conſiderable Time ſince, ſufficiently made out, that our Atmoſphere is a thin elaſtic Fluid, one Part of which gravitates upon another, and whoſe Preſſure is communicated every Way in a Sphere to any given Part thereof. From hence it follows, That if by any external Cauſe the Gravity of any one Part ſhou'd be taken off or diminiſhed, that from all ſides around this Part, the more heavy Air would ruſh in to reſtore the Equilibrium which muſt of neceſſity be preſerved in all Fluids. Now this violent running in of the heavier Air would certainly produce a Wind, which is no more than a ſtrong Motion of the Air in ſome determined Direction. If therefore we can find any outward Cauſe that would at theſe ſtated Seaſons we have mentioned, diminiſh the Weight or Preſſure of the Atmoſphere; we ſhall have the genuine Reaſon of theſe periodical Winds, and the neceſſary Conſequences thereof.

The Flux and Reflux of the Sea was a Phœnomenon too viſible, and too much conducing to the Subſiſtance of Mankind, and all other Animals, to be neglected by thoſe who applied themſelves to the Study of Nature; however all their Attempts to explain this admirable Contrivance of infinite Wiſdom were unſucceſsful, till Sir *Iſaac Newton* reveal'd to the World juſter Principles, and by a truer Philoſophy than was formerly

formerly known, ſhew'd us how by the united or divided Forces of the Sun and Moon, which are encreaſed and leſſened by ſeveral Circumſtances, all the Varieties of the Tides are to be accounted for. And ſince all the Changes we have enumerated in the Atmoſphere do fall out at the ſame Times when thoſe happen in the Ocean; and likewiſe whereas both the Waters of the Sea and the Air of our Earth, are Fluids ſubject, in a great Meaſure, to the ſame Laws of Motion; it is plain, that the Rule of our great Philoſopher takes place here, *viz. That natural Effects of the ſame kind are owing to the ſame Cauſes* (a).

What Difference that known Property of the Air, which is not in Water, makes in the Caſe, I ſhall ſhew anon; ſetting aſide the Conſideration of that for the preſent; It is certain, That as the Sea is, ſo muſt our Air, twice every 25 Hours, be raiſed upwards to a conſiderable Height, by the Attraction of the Moon coming to the Meridian; ſo that inſtead of a *Spherical*, it muſt form itſelf into a *Spheroidal*, or *Oval* Figure, whoſe longeſt Diameter being produced, would paſs thro' the Moon. That the like raiſing muſt follow as often as the Sun is in the Meridian of any Place, either above or below the Horizon. Moreover, That this Elevation is *greateſt* upon the new and full Moons, becauſe both Sun and Moon do then conſpire in their Attraction; *leaſt* on the Quarters, in that they then drawing different Ways, 'tis only the Difference of their Actions produces the Effect. Laſtly, That this Intumeſcence will be of a *middle Degree*, at the Time between the Quarters, and new and full Moon.

(a) Newton. *Princip. p.* 402.

From

From the ſame Principles, the Motion upwards of the Air will be ſtrongeſt of all about the Equinoxes; the Equinoctial Line being over that Circle of the Globe, which has the greateſt Diameter, either of the Luminaries when in that are nearer, and the Agitation of the Fluid Spheroid revolving about a greater Circle, is greater; beſides, the centrifugal Force (ariſing from the diurnal Rotation) is there greateſt of all. This will ſtill be more conſiderable about the new and full Moons happening at theſe Times, for the Reaſons juſt now mentioned. And the leaſt Attraction will be about the Quadratures of theſe Lunar Months, becauſe the Declination of the Moon from the Equator is then greateſt. The different Diſtances of the Moon in her Perigæum and Apogæum, are the Reaſon that theſe full Changes fall out a little before the Vernal, and after the Autumnal Equinox. Now the Inverſe of all this happens when the Luminaries are in the Solſtitial Circles. Laſtly, In the ſame Parallel, when the Moon's Declination is towards the elevated Pole, the Attraction is ſtrongeſt when the Moon is in that Place's Meridian, and weakeſt when ſhe is in the oppoſite Place's Meridian: The contrary happens in the oppoſite Parallel; by reaſon of the ſpheroidal Figure of the Earth and its Atmoſphere.

Whatever has been ſaid on this Head, is no more than applying what Sir *Iſaac Newton* has demonſtrated of the Sea to our Atmoſphere; and it is needleſs to ſhew how neceſſarily thoſe Appearances, juſt now mentioned of *Winds*, at the ſtated Times, *&c.* muſt happen hereupon. It will be of more uſe to conſider the Proportion of the Forces of the two Luminaries upon the *Air*, to that which they have upon the Water of our Globe;

Globe; that it may the more plainly appear what Influence the Alterations hereby made, muſt have upon the Animal Body.

Sir *Iſaac Newton* has demonſtrated, (*a*) That the Force of the Sun to move the Sea, is to the Force of Gravity, as 1 to 12868200. Let that be

$$S.G :: 1.n. \quad \text{Hence, } S = \frac{G}{n}.$$

And that the Force of the Moon to raiſe the Sea is to Gravity, as 1 to 2031821. Let this be

$$L.G :: 1.s. \quad \text{Hence, } L = \frac{G}{s}.$$

And ſince the centrifugal Force of the Parts of the Earth ariſing from its diurnal Motion is to Gravity, as 1 to 291. Let this be

$$C.G :: 1.C. \quad \text{Then } C = \frac{G}{e}. \quad \text{Hence,}$$

$$S+L.\ C :: \frac{G}{n}+\frac{G}{s}.\ \frac{G}{e} :: \frac{1}{n}+\frac{1}{s}.\ \frac{1}{e} ::$$

$$1.\ \frac{sn}{s+n\times e} :: 1.6031.$$

The ſame Philoſopher has taught us (*b*) that the centrifugal Force raiſes the Water at the Equator above the Water at the Poles, to the Height of 85200 Feet. Wherefore if that Force which is as 6031, raiſes the Ocean to 85200 Feet, the united Forces of the Sun and Moon, which are as 1. will raiſe the ſame to 14 Feet, for $\frac{85200}{6031} = 14$. *Proximè.*

(*a*) *Princip. Lib.* 3. *Prop.* 36.
(*b*) *Ibid. Lib.* 3. *Prop.* 37.

Now

Now we know that the more eaſily the Water can obey the Attraction, with the more Force are the Tides moved; but ſince, as Mr. *Halley* has determin'd it, (*a*) our Atmoſphere is extended to 45 Miles, whereas the middle Depth of the Ocean is but about half a Mile; it is plain, that the Air revolving in a Sphere about 100 Times larger than that of the Ocean, will have a proportionably greater Agitation.

Beſides; Rocks, Shelves, and the Inequality of Shoars are a great Stop to the Acceſs and Receſs of the Sea: But nothing repels the riſing Air, which is alſo of ſuch Thinneſs and Fluidity, that it is eaſily driven, and runs every Way.

Nor ought we to omit, that it is the univerſal Law of Bodies attracted, that the Force of Attraction is reciprocally as the Squares of their Diſtances; ſo that the Action of the Sun and Moon will be greater upon the Air than upon the Water, upon the Account of its Nearneſs.

But the Conſideration of the Elaſticity is ſtill of greater Moment here, of which this is the Nature, that it is reciprocally as the Preſſure, ſo that the incumbent Weight being diminiſhed by the Attraction, the Air underneath will upon this Score be mightily expanded.

Theſe and ſuch like Cauſes will make the Tides in the Air to be much greater than thoſe of the Ocean; nor is it neceſſary to our purpoſe to determine, by nice Calculations, their particular Forces; it is ſufficient to have proved that theſe Motions muſt both be univerſal, and alſo return at certain Intervals.

(*a*) *Philoſ. Tranſ.* No. 181.

Now ſince the raiſing of the Water of the Ocean 14 Feet, produces Torrents of ſuch a prodigious Force, we may eaſily conceive what Tempeſts of Winds (if not otherwiſe check'd) the Elevation of the Air much higher (perhaps above a Mile) will neceſſarily cauſe. And there is no doubt to be made, but that the ſame infinitely wiſe Being who contrived the Flux and Reflux of the Sea, to ſecure that vaſt Collection of Waters from Stagnation and Corruption (which would inevitably deſtroy all the Animals and Vegetables on this Globe) has ordered this Ebb and Flood of the Air of our Atmoſphere, with the like good Deſign, that is to preſerve (in Caſe all other Cauſes ſhould fail, as they may, and at Times do in ſome Countries) the ſweet Freſhneſs, and briſk Temper of this Fluid, ſo neceſſary to Life, and keep it, by a kind of continual Circulation, from Deadneſs and Stinking.

This Reaſoning is liable to only one Objection that I know of, and that is this: That the Appearances we have mentioned cannot be owing to the Cauſes now aſſigned; ſince by Calculation from them, the Mercury muſt at new and full Moon ſubſide in the Barometer to a certain Degree, which yet we do not obſerve to happen.

In anſwer to which, (beſides that there have been ſome Obſervations made of the ſinking of the Mercury at thoſe Times; and it may perhaps be the Fault of the Obſervers that theſe have not been reduced to any Rule) we are to conſider, That altho' Winds and Alterations in the Preſſure of the Atmoſphere, are the neceſſary Conſequents of the lunar Attraction, and true Cauſes of the different Riſe of the Mercury in the Barometer; yet theſe may be produced many other ways too, and therefore tho' regularly the Mercury would always

fall

fall at the new and full Moon, thoſe other Cauſes may be ſtrong enough, even to raiſe it at thoſe Seaſons; in as much as two contrary Winds, for Inſtance, blowing towards the Place of Obſervation, may accumulate the Air there, ſo as to increaſe both the Height and Weight of the incumbent Cylinder; in like Manner, the Direction of two Winds may be ſuch, as meeting at a certain Angle they may keep the Gravity of the Air in the middle Place unalter'd; and a Thouſand ſuch Varieties there may be, by which the Regularity of Appearances of this Nature may be hinder'd. Now the other Springs, from which ſuch Changes in the Air may ariſe, are theſe;

1. Elaſtic Vapours forc'd from the Bowels of the Earth, by ſubterraneous Heats, and condenſed by whatever Cauſe in the Atmoſphere.

2. A Mixture of Effluvia of different Qualities in the Air, may by Rarefactions, Fermentations, *&c.* produce Winds and other Effects like thoſe reſulting from the Combination of ſome Chymical Liquors; and that ſuch Things happen, we are aſſur'd from the Nature of Thunder, Lightning, and Meteors.

3. From the Eruptions of Vulcanoes and Earthquakes in diſtant Places, Winds may be propagated to remoter Countries.

4. The divided or united Forces of the other Planets and of Comets, may variouſly diſturb the Influence of the Sun and Moon, *&c.* We know that there happen violent Tempeſts in the upper Regions of the Air, while we below enjoy a Calm; and how many Ridges of Mountains there are on our Globe, which interrupt and check the Propagation of the Winds; ſo that it is no wonder that the Phænomena we have aſcribed to the Action of

the Sun and Moon, are not always conſtant and uniform, and that every Effect does not hereupon follow; which, were there no other Powers in Nature able to alter the Influence of this, might in a very regular and uniform Manner be expected from it.

Theſe Things being premiſed, it will not be difficult to ſhew (as was propoſed in the firſt Place) that theſe Changes in our Atmoſphere at high Water, new and full Moon, the Equinoxes, *&c.* muſt occaſion ſome Alterations in all Animal Bodies; and that from the following Conſiderations.

1. All living Creatures require Air of a determin'd Gravity to perform Reſpiration eaſily, and with Advantage; for it is by its Weight that this Fluid inſinuates itſelf into the Cavity of the Breaſt and Lungs. Now the Gravity, as we have prov'd, being leſſen'd at theſe Seaſons, a ſmaller Quantity only will inſinuate itſelf, and this muſt be of ſmaller Force to comminute the Blood, and forward its Paſſage into the left Ventricle of the Heart, whence a ſlower Circulation inſues, and the Secretion of the Spirits is diminiſhed.

2. This Effect will be the more ſure, in that the Elaſticity of the Atmoſphere is likewiſe diminiſh'd. Animals want Air as heavy ſo elaſtic to a certain Degree; for as this is by its Weight forced into the Cavity of the *Thorax* in Inſpiration, ſo the Muſcles of the *Abdomen* preſs it into the *Bronchi* in Expiration, where the bending Force being ſomewhat taken off, and ſpringy Bodies when unbended, exerting their Power every Way, in Proportion to their Preſſures, the Parts of the Air puſh againſt all the Sides of the *Veſiculæ*, and promote the Paſſage of the Blood.

We

We have a convincing Inſtance of all this, in thoſe who go to the Top of high Mountains, for the Air is there ſo pure (as they call it) that is, wants ſo much of its Gravity and Elaſticity, that they breathe with very great Difficulty.

3. All the Fluids in Animals have in them a Mixture of elaſtic *Aura*, which when ſet at Liberty, ſhews its Energy, and cauſes thoſe Fermentations we obſerve in the Blood and Spirits: Now when the Preſſure of the Atmoſphere, upon the Surface of our Body is diminiſh'd, the inward Air in the Veſſels muſt neceſſarily be inabled to exert its Force, in Proportion to the leſſening the Gravity and Elaſticity of the outward; hereupon the Juices begin to ferment, change the Union and Cohæſion of their Parts, break their Canals, *&c.*

This is very plain in living Creatures put into the Receiver, exhauſted by the Air-Pump, which always ſwell as the Air is more and more drawn out; their Lungs at the ſame Time contracting themſelves, and falling ſo together as to be hardly diſcernible *(a)*.

E're we proceed to Matters of Fact, it may be worth the while to take Notice, that Effects depending on ſuch Cauſes as theſe, muſt of Neceſſity be moſt viſible in weak Bodies and morbid Conſtitutions, when other Circumſtances concur to their taking Place. For this Reaſon, whatever Miſchiefs do hence follow, cannot in the leaſt diſparage the wiſe Contrivance of infinite Power in ordering theſe Tides of our Atmoſphere. The Author of Nature, we know, has made all Things to the greateſt Advantage that could be, for the whole Syſtem of Animals on our Globe,

(a) *Eſperienze dell' Academia del Cimento*, p. m. 113.

but

but it was impoſſible that ſuch a Diſpoſition ſhould not in ſome Caſes be prejudicial to a few. The Poſition and Diſtance of the Sun are ſo adjuſted, as to give in the moſt beneficial Manner poſſible, Heat and Light to the Earth; yet this notwithſtanding, ſome Places may be too hot for ſome weakly Bodies; ſome Autumns too ſultry to agree with ſome Animals, and ſome Winters too cold to be endured by ſome tender Creatures: The whole however we muſt own, is moſt carefully provided for. Beſides, as moſt of theſe laſt mentioned Inconveniences are by eaſy Shifts to be avoided; ſo there are ſuch powerful Checks put to this aerial Flux and Reflux, ſo many ways of abating the Damages accruing from it now and then; that theſe are of no Account in compariſon of the mighty Benefits hence ariſing, in which the Race of Mankind does univerſally ſhare.

A DIS-

A

DISCOURSE

Concerning the

ACTION of the SUN and MOON on *Animal Bodies.*

PART II.

THERE are no Hiſtories in Phyſick which we may more ſafely take upon the Credit of the Authors who relate 'em, than ſuch as we are now going to mention. In ſome Caſes a Point may perhaps be ſtrained to ſerve a darling Hypotheſis which the Writer has taken up, but here we are much more likely to have pure Matter of Fact, becauſe hitherto no one has pretended the Appearances of this Kind to be within the Reach of any Scheme of Philoſophy.

Epileptical Diſeaſes, beſides the other Difficulties with which they are attended, have this alſo ſurprizing, that in ſome the Fits do conſtantly return every New and Full Moon; *the Moon* (ſays *Galen* (a) *governs the Periods of Epileptick Caſes.* Upon this Score, They who were thus

(a) Τας τῶν ἐπιλήπτων τηρεῖ περιόδους. *De Dieb. Critic. lib.* 3.

affected

affected were called Σεληνιακοὶ (*b*) and in the Hiſtories of the Goſpel Σεληνιαζόμενοι (*c*) by ſome of the *Latins* afterwards, *Lunatici* (*d*). *Bartholin* (*e*) tells a Story of one Epileptick who had apparent Spots in her Face, which according to the Time of the Moon, varied both their Colour and Magnitude.

But no greater Conſent in ſuch Caſes was perhaps ever obſerved than what I ſaw ſome Time ſince in a Child about five Years old, in which the Convulſions were ſo ſtrong and frequent, that Life was almoſt deſpair'd of, and by Evacuations and other Medicines very difficultly ſaved. The Girl, who was of a luſty full Habit of Body, continued well for a few Days, but was at Full Moon again ſeized with a moſt violent Fit, after which, the Diſeaſe kept its Periods conſtant and regular with the Tides; She lay always Speechleſs during the whole Time of Flood, and recovered upon the Ebb. The Father who lives by the *Thames* Side, and does Buſineſs upon the River, obſerved theſe Returns to be ſo punctual, that not only coming Home, he knew how the Child was before he ſaw it, but in the Night has riſen to his Employ, being warned by Cries when coming out of her Fit, of the turning of the Water. This continued 14 Days, that is, to the next great Change of the Moon, and then a dry Scab on the Crown of the Head, (the Effect of an Epiſpaſtick Plaiſter, with which I had covered the whole *Occiput* in the Beginning of the Illneſs) broke, and from the Sore, tho' there had been no ſenſible

(*b*) *Alexand. Trallian.* lib. 1. c. 15.
(*c*) Matth. *c.* xvii. *v.* 15.
(*d*) *Apuleius de Virtutib. Herbar.* cap. 6. & 95.
(*e*) *Anatom. Centur.* 2. H. 72.

Discharge this Way for above a Fortnight, ran a considerable Quantity of limpid Serum; upon which, the Fits returning no more, I took great Care to promote this new Evacuation by proper Applications, with desired Success, for some Time; and when it ceased, besides two or three Purges with *Mercurius Dulcis*, &c. ordered an Issue in the Neck, which being thought troublesome, was made in the Arm; the Patient however has never since felt any Attacks of those frightful Symptoms.

Whether or no it be thro' Want of due Heed and Enquiry that we have not in all the Collections of Histories and Cases, any Instance of the like Nature so particular as this is, I know not; this is certain, that as the *Vertigo* is a Disease nearly related to the *Epilepsy*, and the *Hysterical Symptoms* do partake of the same Nature; so both one and the other are frequently observed to obey the Lunar Influence. In like Manner, the raving Fits of mad People, which keep Lunar Periods, are generally in some Degree Epileptic too.

Tulpius (*a*) and *Piso* (*b*) afford us remarkable Instances of Periodical *Palseys*.

Every one knows how great a Share the Moon has in forwarding those Evacuations of the weaker Sex, which have their Name from the constant Regularity they keep in their Returns; and there is no Question to be made, but the Correspondency we here observe, would be greater still, and even Universal, did not

(*a*) *Observ. Med.* lib. 1. cap. 12.
(*b*) *De Morb. à seroſâ Colluvie*, Obs. 28.

many Accidents, and the infinite Varieties in particular Conſtitutions one Way or other concur to make a Difference. It is very obſervable, that in Countries neareſt to the *Æquator*, where we have proved the Lunar Action to be ſtrongeſt, theſe Monthly Secretions are in much greater Quantity than in thoſe near the Poles, where this Force is weakeſt. This *Hippocrates* (*c*) takes Notice of, and gives it as one Reaſon why the Women in *Scythia* are not very fruitful.

The Caſe being thus with Females, it is no wonder if we ſometimes meet with Periodical Hæmorrhages anſwering to the Times of the Moon in Males alſo. For as a greater Quantity of Blood in Proportion to the Bulk in *one* Sex, is the Reaſon of its diſcharging itſelf thro' proper Ducts, at certain Intervals, when the Preſſure of the external Air being diminiſh'd, the internal *Aura* can exert its Elaſticity; ſo in the *other*, if at any Time there happens to be a Superabundancy of the ſame Fluid, together with a weak Tone of the Fibres; it is plain that the Veſſels will be moſt eaſily burſt, when the Reſiſtance of the Atmoſphere is leaſt. And this more eſpecially, if any accidental Hurt, or rarefying Force has firſt given Occaſion to the other Cauſes to take Effect.

I know a Gentleman of a tender Frame of Body, who having once, by over-reaching, ſtrained the Parts about the Breaſt; fell thereupon into a Spitting of Blood, which for a Year and half conſtantly return'd every New Moon, and decreaſing gradually, continued al-

(*c*) *De Aere Aquis & Locis.*

ways

ways four or five Days. The Fits being more or leſs conſiderable, according as his Management about that Time, contributed to a greater or leſſer Fullneſs of the Veſſels.

We have two notable Inſtances of the like Nature in our Philoſophical Tranſactions; the one (*a*) of a Perſon, who from his Infancy to the 24th Year of his Age, had every full Moon an Eruption of Blood on the right Side of the Nail of his left Thumb, at firſt to three or four Ounces, and after his ſixteenth Year, to half a Pound each Time; which when by ſearing the Part with a hot Iron, it ſtopped, he fell into a *Sputum Sanguinis*, and by frequent Bleeding, *&c.* was very difficultly ſaved from a Conſumption. The other (*b*) is a Story of an *Inn-Keeper* in *Ireland*, who from the 43d Year of his Life, to the 55th (in which it killed him) ſuffered a Periodical Evacuation at the Point of the Fore-Finger of his Right-hand; and altho' the Fits here kept not their Returns ſo certain as in the fore-mentioned Caſe, (it may be either from the irregular Way of living of the Patient, or the mighty Change every Effuſion made in his Habit of Body, the Quantity ſeldom amounting to leſs than four Pounds at a Time) yet there is this remarkable Circumſtance in the Relation, that the firſt Beginning of this *Hæmorrhage* was at *Eaſter*, that is, the next Full Moon after the Vernal *Equinox*, which is one of the two Seaſons of the Year, at which we have proved the Attraction of the Air, or leſ-

(*a*) No. 272.
(*b*) *Philoſ. Tranſ.* No. 171.

sening of its Pressure, to be greater than at any other Time whatsoever.

But we are besides this to consider, That the static Chair, and nice Observation taught *Sanctorius*, (*a*) That *Men do increase a Pound or two in their Weight every Month, which Overplus is discharged at the Month's End, by a Crisis of copious, or thick turbid Urine.*

It is not therefore at all strange, that we shou'd once a Month be liable to the Returns of such Distempers as depend upon a Fullness of the Vessels, that these should take Place at those Times especially, when the ambient Air is least able to repress the Turgency; and that tho' New and Full Moon are both of equal Force, yet that sometimes one, and sometimes the other only should Influence the Periods, according as this or that happens to fall in with the inward Repletion.

The Afflux of Humours to Ulcers is sometimes manifestly altered by this Power; (*b*) *Baglivi* was acquainted with a learned young Man at *Rome*, who labour'd under a *Fistula* in the *Abdomen*, penetrating to the *Colon*, which discharged so plentifully in the Increase, and so sparingly in the Decrease of the Moon, that he could make a very true Judgment of the Periods and Quadratures of that Planet, from the different Quantity of the *Matter* that came from him.

Nephritic Paroxysms have frequently been observed to obey the Lunar Attraction: *Tulpius* (*c*)

(*a*) *Medicin. Static.* Sect. 1. Aph. 65.
(*b*) *De Experiment. circa Sanguin.* p. m. 341.
(*c*) *Observat.* Lib. 2. c. 43. *vid. etiam Observ.* 52.

relates

relates the Case of Mr. *Ainsworth*, an *English* Minister at *Amsterdam*, who had a Fit of the Gravel and Suppression of Urine every Full Moon, of which he found no Relief till the Moon decreased, unless by Bleeding at the Arm. After his Death two large Stones were taken out of his Bladder, and the *Pelvis* of the left Kidney was enlarged to that Degree by the Quantity of Urine so often stopp'd there, as to contain almost as much as the Bladder itself.

I was present, not long since, at the Dissection of a Child about five or six Years old, who died of the frequent Returns of *Nephritic* Fits, attended with Vomitings and a *Diarrhæa*. The Kidneys and Ureters were quite stuffed with a slimy calculous Matter, and it was very instructive to see the different Degrees of Concretion in the several Parts of it, from a clear limpid Water, to a hard friable Substance. Dr. *Groenvelt*, who had tended the Boy in his Illness, observed him to be seized with his Pains at every Full Moon for several Months together, which generally ended with the voiding of a Stone.

What Influence the Moon has in *Asthmas*, (*a*) *Van Helmont* takes Notice, *Exacerbatur Paroxysmus* (says he) *Lunæ Stationibus, & ævi tempestatibus quas ideo præsentit & præsagit.* (*b*) And Sir *John Floyer*, who has given us a more particular History of this Disease than any Author, observes, that *The Fits usually return once in a Fortnight, and frequently happen near the Change of the Moon.*

(*a*) *Asthma & Tuss.* § 22.
(*b*) *Treatise of the Asthma*, p. 17.

'Tis

'Tis a more uncommon Effect of this attractive Power that is related by the learned *Kerckringius.* (*a*) He knew a young Gentlewoman, whoſe Beauty depended upon the Lunar Force, inſomuch that at Full Moon ſhe was Plump and very Handſome, but in the Decreaſe of the Planet ſo wan and ill-favoured, that ſhe was aſham'd to go abroad 'till the Return of the New Moon gave *Fullneſs* to her Face, and *Attraction* to her Charms.

Tho' this is indeed no more than an Influence of the ſame Kind, with that the Moon has always been obſerved to have upon Shell-Fiſh, and ſome other living Creatures. For as the old *Latin* Poet *Lucilius* ſays, (*b*)

Luna alit Oſtrea & implet Echinos, Muribu' Fibras
Et Pecui addit———————

And after him *Manilius* (*c*)

Sic ſubmerſa Fretris Concharum & Carcere Clauſa,
Ad Lunæ motum variant animalia Corpus.

It is very well worth the Pains to enquire what Share ſuch an Alteration in the Weight and Preſſure of the Atmoſphere may have in the *Criſes* or Changes of acute Diſeaſes. The Antients made great Account of *critical* Days, and regulated their Practice according to the Expectation they had from them; This Part of Phyſick is grown now into Diſuſe, quite

(*a*) *Obſervat. Anatomic.* 92.
(*b*) *Apud* A. Gellium, lib. 20. c. 8.
(*c*) *Aſtronomic.* lib. 2.

ſlighted,

ſlighted, and even ridiculed; and that I ſuppoſe chiefly for theſe two Reaſons. In the firſt Place, becauſe the earlieſt Obſervations of this Kind, which were drawn into Rules, being made in *Eaſtern* Countries, when theſe came to be applied to the Diſtempers of the *Northern* Regions, without Allowance given for the Difference of the Climate, they were oftentimes found not to anſwer. And ſecondly, Fevers of old were treated with few or no Medicines, the Motions of Nature were carefully watched, and no Violence offer'd to interrupt her Work. The Hiſtories therefore of *Criſes*, though of great Uſe, and Certainty under ſuch Management as this, were at length unavoidably ſet aſide and loſt; when acute Caſes came to be cured, according to this or that Hypotheſis, not only by Evacuations, but hot or cold Alteratives too; there being no longer any Room for thoſe Laws of Practice, which ſuppoſed a regular and uniform Progreſs of the Diſtemper.

Wherefore, in order to underſtand a little both what might induce the firſt Maſters of our Profeſſion to ſo nice and ſtrict an Obſervance in this Point; and what Grounds there may be now, for a more due Regard to their Precepts, even upon the Score of the Lunar Attraction only, I propoſe the following Remarks.

1. All Epidemick Diſeaſes, do in their regular Courſe require a ſtated Time, in which they come to their Height, decline, and leave the Body free.

This is ſo conſtant and certain, that when a Fever of any *Conſtitution* which is *continual* in one Subject, happens from ſome other Cauſe,

in

in another to be *intermitting*, the Paroxiſms do always return ſo often as all together to make up juſt as many Days of Illneſs as he ſuffers, whoſe Diſtemper goes on from Beginning to End, without any Abatement.

Dr. *Sydenham*, a ſworn Enemy to all Theories, learn'd thus much from downright Obſervation; and gives this Reaſon why autumnal Quartans holds ſix Months, becauſe by Computation the Fits of ſo long a Time amount to 336 Hours, or 14 Days, the Period of a continual Fever of the ſame Seaſon. (*a*)

So *Galen* takes Notice, that when an exquiſite Tertian is terminated in ſeven Paroxiſms, a true Continual, at the ſame Time, has its Criſis in ſeven Days; that is, the Fever laſts as long in one as in the other, in as much (ſays he) as *a Fit in an Intermitting Fever, anſwers to a Day in a Continual.* (*b*) Now this ſo comes to paſs, becauſe,

2. In theſe Caſes there is always a Fermentation in the Blood, which goes not off till the active Particles are thrown out by thoſe Organs of Secretion, which, according to the Laws of Motion, are moſt fitted to ſeparate 'em. And,

3. As different Liquors put upon a Ferment, are depurated in different Times, ſo the Arterial Fluid takes up a determined Period, of which it is diſcharged of an induced Effervescence.

4. The Symptoms, during this Ebullition, do not proceed all along in the ſame Tenour; but on ſome Days particularly, they give ſuch

(*a*) *De Febr. Intermit.* Ann. 1661. pag. *m.* 65.
(*b*) *Comment. in Aphor.* 59. lib. 4. & *de Criſib.* lib. 2. c. 6.

evident Marks of their good or bad Quality, that the Nature of the enſuing *Solution* may very well be gueſs'd at, and foretold by 'em.

Things being thus, Thoſe Days on which the Diſeaſe was ſo evidently terminated one Way or other, might very juſtly be call'd the Days of *Criſis*; and thoſe upon which the Tendency of Illneſs was diſcovered by moſt viſible Tokens, the *Indices* of the *critical Days*.

And thus far the Foundation was good: but when a falſe Theory happen'd unluckily to be joined to true Obſervations, this did a little puzzle the Cauſe. *Hippocrates*, it is plain, knew not to what to aſcribe that remarkable Regularity with which he ſaw the Periods of Fevers were ended on the *Seventh*, *Fourteenth*, *One and Twentieth* Day, *&c. Pythagoras* his Philoſophy was in thoſe Ages very Famous, of which *Harmony* and the *Myſteries of Numbers* made a conſiderable Part, *Odd* were more powerful than *Even*, and *Seven* was the moſt perfect of all. Our great Phyſician eſpouſed theſe Notions, (*a*) and confined the Stages of acute Diſtempers to a *Septenary* Progreſſion (*b*), upon which this Inconvenience follow'd, that when a Criſis fell out a Day ſooner or later than this Computation required, his Meaſures were quite broken; and that this

(*a*) *Epidem.* lib. 1. Sect. 3.

(*b*) αἱ μὲν ἓν ἡμέραι ἐπισημόταταί εἰσιν ἐν τοῖς πλείστοις ἅπτε πρῶται καὶ ἑβδομιαῖαι πολλαί μὲν περὶ νόσων, πολλαὶ δὲ καὶ τοῖς ἐμβρύοις. *De Septimeſtri Partu.*

muſt neceſſarily oftentimes happen, will appear by and by.

Upon this Score *Aſclepiades* rejected this whole Doctrine as vain, (*a*) and *Celſus* finding it to be too nice and ſcrupulous, obſerves that the *Pythagorean Numbers led the Ancients into the Error.* (*b*)

Galen being aware of this, ſucceeded much better in his reaſoning upon the Matter, and very happily imputed the critical Changes not to the Power of Numbers, but to the Influence of the Moon; which he obſerves, *has a mighty Action upon our Earth, exceeding the other Planets, not in Energy, but in Nearneſs* (*c*) So that according to him, the Septenary Periods in Diſeaſes are owing to the *Quarterly Lunar Phaſes, which are the Times of the greateſt Force, and which return in about ſeven Days.* (*d*)

The Reſult of the whole Affair, in ſhort is this: A *Criſis* is no more than the Expulſion of the morbific Matter out of the Body, thro' ſome or other of the Secretory Organs; in order to which, it is neceſſary that this ſhould be prepar'd and comminuted to ſuch a Degree, as is required to make it paſs into the Orifices of the reſpective Glands; and therefore *as* the moſt *perfect Criſis* is by *Sweat*, (both by Reaſon that the Subcutaneous Glands do naturally diſcharge more than all the other put together, and alſo that their Ducts being the

(*a*) *Vid. Celſum.* lib. 3. c. 4.
(*b*) *Ibid.*
(*c*) *De Diebus Decretor* lib. 3.
(*d*) *Ibid.*

ſmalleſt

ſmalleſt of any, whatſoever comes this Way is certainly very well divided and broken) *ſo* the moſt *imperfect* is an *Hæmorrhage*; becauſe This is an Argument that what offends is not fit to be caſt off in any Part, and conſequently breaks the Veſſels by the Effervescence of the Blood. An *Abſceſs* in thoſe Organs which ſeparate thick ſlimy Juices, is of a middle Nature betwixt theſe two.

Now it is very plain, That if the Time, in which either the Peccant Humour is prepar'd for Secretion, or the Fermentation of the Blood is come to its Height, falls in with thoſe Changes in the Atmoſphere which diminiſh its Preſſure; the *Criſis* will then be more compleat and large. And alſo, that this Work may be forwarded or delay'd a Day upon the Account of ſuch an Alteration in the Air; the Diſtention of the Veſſels upon which it depends, being hereby made more eaſy, and a weak Habit of Body in ſome Caſes ſtanding in need of this outward Aſſiſtance. Thus a Fever which requires about a Week to its Period, may ſometimes, as *Hippocrates* obſerved, have a good Criſis on the ſixth, and ſometimes not 'till the eighth Day.

In Order therefore to make true Obſervations of this Kind, the Time of Invaſion is to be conſidered, The genuine Courſe of the Diſtemper muſt firſt be watched, which is not to be interrupted by any violent Methods: The Strength of Nature in the Patient is to be conſidered, and by what Secretions the Criſis is moſt likely to be performed; and it will then be found, that not only the *New* and *Full* Moons, but even the *Southings*, whe-

ther visible or latent, of the Planet, are here of considerable Moment.

For Confirmation of which, we need only to reflect on what Mr. *Paschal* has remark'd, *concerning the Motions of Diseases and Births and Deaths (a)*. Dividing the Νυχθήμερον into Four Senaries of Hours; the first consists of three Hours before the Southing of the Moon, and three after; the second of the six Hours following, and the third and fourth of the remaining Quarters of the natural Day: He takes Notice that none are born, or die a natural Death in the first and third Senaries, which he calls first and second Tides, but all either in the second or fourth Senaries, which he calls first and second Ebbs. In like manner, that in Agues, the Tumult of the Fits generally lasts all the Tiding-Time, and then goes off in kindly Sweats in the Ebbs. From whence he very rationally concludes, that Motion, Vigour, Action, Strength, *&c.* appear most, and do best in the *Tiding Senaries*; and that Rest, Relaxation, Decay, Dissolution, *&c.* belong to the *Ebbing Senaries*.

(a) *Philos. Transact.* No. 202.

A

COROLLARY.

IT having been explained in the Beginning of this Diſcourſe, how thoſe Influences of the Heavens, which favour the *Returns of Diſeaſes*, may likewiſe raiſe *Winds* at the ſame Times; and that we feel the different Effects of *Theſe* according as other Cauſes do concur to the Motion of the Air; it will not be amiſs to ſhew, in one Inſtance or two, how much Natural Hiſtory confirms this Reaſoning.

There happened on the 26th of *November*, 1703, a little before Midnight, a moſt terrible *Storm* of *Wind*, the Fury of it is ſtill freſh in every one's Mind, which laſted above ſix Hours.

It is not to the preſent Purpoſe to relate its Hiſtory and Cauſes; What we obſerve is, That the Moon was at that Time *in Perigæo*, and juſt upon the Change to *New*. Upon both which Accounts its Action in raiſing the Atmoſphere muſt be great; And hence indeed the *Tides* which followed were alſo very great, and the *Mercury* in the *Barometer*, at leaſt, in moſt Places, fell very low.

This Influence was, without all doubt, aſſiſted by ſome ſuch other Cauſes of *Winds*, as we

we have mentioned; theſe we can't know, but may however take Notice how much the manifeſt State of the Air contributed to this Calamity.

After a greater Quantity of Rains than ordinary had fallen in the Summer and Autumn, in thoſe Places where the Storm was felt, the Winter came on much warmer than uſual; ſo that the Liquor in a Thermometer, of which the 84th Degree notes Froſt, never fell below the 100th (*a*).

Hence we may very well believe, that the Atmoſphere was at that Time fill'd with Atoms of *Salts* and *Sulphur*, out of the Vapours rais'd by the Heat from the moiſt Earth, which being variouſly combined and agitated, gave that deadly Force to the Motion of the Air.

A Proof of this we have not only from the frequent *Flaſhes* of *Lightning*, obſerved a little before the Storm, but alſo from what the Country People took Notice of the next Day, *viz.* that the Graſs and Twiggs of the Trees, in Fields remote from the Sea, taſted very ſalt, ſo that the Cattle wou'd not feed on them.

Our Hiſtories mention another Storm, which if not equal to this laſt in Violence, is however thought the greateſt that had then ever been known and memorable from the Time at which it happened, *viz.* on the 3d of *September*, 1658, the Day on which the Uſurper *Oliver Cromwell* died.

No *Ephemerides* that I know of relate the

(*a*) *Vid.* Philoſ. Tranſact. No. 289.

Condition

Condition of the Air that Year, but it is ſufficient to remark, That whatever other Cauſes concurr'd, their Force was accompanied with a *Full Moon*, juſt before the Time of the *Autumnal Equinox*.

Upon the ſame Score it comes to paſs, That in thoſe Countries which are ſubject to frequent *Inundations*, theſe Calamities are obſerved to happen at the Time of the *Moon*'s greateſt Influence, ſo that the learned *Baccius* (*a*) has rightly enough laid the Cauſe of ſuch Miſchiefs upon immoderate *Tides of the Ocean*, being unhappily accompanied with the *attractive Force* of ſome or other *Stars*.

Dr. *Childrey*, in his *Britannia Baconica* (*b*), has from ſeveral Inſtances ſhewn the *Lunar* Action in Damages of this Kind.

Such and the like *Natural* Cauſes have *Storms* and *Tempeſts*; for as to the Queſtion of Divine Power, whether or no Calamities of this Kind do not ſometimes, by the Anger of Heaven, happen out of the Courſe of Nature, it is not my Buſineſs to diſpute, nor would I by any means endeavour to abſolve Mens Minds from the Bands of Religion. For although we muſt allow all the Parts of the Machine of this World to be framed and moved by eſtabliſhed Laws, and that the ſame Diſpoſition of its Fabrick, which is moſt beneficial to the whole, muſt of Neceſſity, in ſome few Places now and then occaſion Hurts and Miſchiefs; it is however moſt highly reaſonable, that we ſhould yield to the Supreme

(*a*) *Del* Tevere, lib. 3. p. 228.
(*b*) Pag. 97.

Creator

Creator an abſolute Power over all his Works; Concluding withal, that it was perhaps agreeable to Divine Wiſdom, to order the Make of the World after ſuch a Manner, as might ſometimes bring Miſchiefs and Calamities upon Mankind, whom it was neceſſary by the Frights of *Storms*, *Thunder* and *Lightning* to keep in a continual Senſe of their Duty.

F I N I S.